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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,826	12/03/2003	Manfred Albrecht	HSJ920030213US1	7489

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THOMAS R. BERTHOLD
18938 CONGRESS JUNCTION COURT
SARATOGA, CA 95070

EXAMINER	
MERCEDES, DISMERY E	

ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/727,826	ALBRECHT ET AL.	
	Examiner	Art Unit	
	Dismery E Mercedes	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-36* is/are allowed.

6)☒ Claim(s) *1-14 and 17-20* is/are rejected.

7)☒ Claim(s) *15,16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/03/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 12/03/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art, hereinafter, Chou (US 5, 820, 769) in view of Litvinov et al. (US 6,660,357 B1), further in view of Lundstrom (US 2004/0080847 A1).

Chou discloses a substrate; and a plurality of spaced-apart magnetic islands on the substrate (abstract). Chou fails to particularly disclose that each island comprising at least two stacked magnetic cells and being separated from the other cells in its island.

However, Litvinov et al. discloses such (as depicted in FIG.4, abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Litvinov's technique into the magnetic recording medium as disclosed by Chou, because it would

provide Chou's magnetic recording medium with the enhanced capability of reducing or eliminating noise from the soft underlayer (abstract, line 7-8 of Litvinov).

Chou also fails to disclose each cell having perpendicular maretic anisotropy. However, Lundstrom discloses such (abstract, lines 12-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement Lundstrom's technique into the magnetic recording medium as disclosed by Chou, because it would provide Chou's magnetic recording medium with the enhanced capability of obtaining effective conditioning of patterned features having relatively small widths (abstract, lines 12-15 of Lundstrom).

As to Claim 2, in the obvious combination, supra, Litvinov further discloses, wherein the magnetic moments of each of two neighboring cells in an island are oriented either parallel or antiparallel (as depicted in FIG.4 & abstract).

As to Claim 3, in the obvious combination, supra, Chou further discloses, each cell is a single magnetic domain (abstract).

As to Claim 4, in the obvious combination, Litvinov further discloses, wherein each cell has a magnetic moment oriented in one of two opposite directions substantially perpendicular to the substrate (col.1, lines 61-65).

As to Claim 5, in the obvious combination, supra, Litvinov further discloses, wherein each island includes a layer of nonmagnetic material between the stacked cells for separating the cells (as depicted in FIG.4, "36a", col.4, lines 46-47).

As to Claim 8, Litvinov further discloses wherein the islands are spaced apart by spacing material formed on the substrate between the islands and having substantially no perpendicular magnetic anisotropy (as depicted in FIG.4, "36a", col.4, lines 46-47).

As to Claim 9, Litvinov further discloses the spacing material is nonmagnetic (as depicted in FIG.4, "36a", col.4, lines 46-47).

As to Claim 10, Litvinov further discloses there are only two cells in each island (as depicted in FIG.4).

As to Claim 11, in the obvious combination, supra, Litvinov and Lundstrom further discloses wherein each cell is a multilayer of alternating layers of a first material selected from the group consisting of Co and Fe and a second material selected from the group consisting of Pt and Pd (col.3, lines 7-15 of Litvinov) said multilayer having maretic anisotropy substantially perpendicular to the substrate (abstract, of Lundstrom).

As to Claim 12, Litvinov further discloses each cell is formed of a ferromagnetic material comprising one or more of Co, Ni, Fe and alloys thereof (col.3, lines 10-15).

As to Claim 17, Litvinov further discloses an underlayer on the substrate beneath the islands (col.3, line 10 & lines 45-50).

As to Claim 18, Litvinov further discloses a soft magnetically permeable underlayer of material selected from the group consisting of NiFe, FeAlSi, FeTaN, FeN, COFeB and CozrNb (col.3, lines 45-50).

As to Claim 19, Litvinov further discloses 19. the islands are arranged on the substrate in a plurality of generally concentric circular tracks (as depicted in FIG.3).

As to Claim 20, Chou further discloses the islands are arranged on the substrate in an array of mutually perpendicular rows (as disclosed in Figures 1B & 3 on a perpendicular surface).

4. Claims 6,7,13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art, hereinafter, Chou (US 5, 820, 769) in view of Litvinov et al. (US 6,660,357 B1),

further in view of Lundstrom (US 2004/0080847 A1), further in view of Yusu et al. (US 6,174,597 B1).

As to Claim 6, the combination of Chou, Litvinov, and Lundstrom discloses the medium as disclosed in parent claim 1, but failed to particularly disclose wherein the islands are spaced apart by voids.

However, Yusu et al. discloses a magnetic recording medium where voids are generated on the recording layer (col.14, lines 37-50). It would have been obvious to one of ordinary skill in the art at the time of invention to use voids to separate the island, because Yusu et al. teaches that voids improve the adhesion properties of the lubricant (col.14, lines 46-48 of Yusu et al.).

As to Claim 7, Chou further discloses wherein the substrate is patterned into a plurality of pillars and wherein the islands are formed on the pillars (col.2, lines 65-67 & col.3, lines 32-36).

As to Claim 13, Yusu et al. further discloses each cell is formed of a ferromagnetic material comprising an alloy of Co and Cr having a magnetocrystalline anisotropy substantially perpendicular to the substrate (col.1, lines 16-23 & col.4, lines 10-21 & col.7, lines 12-16).

As to Claim 14, Yusu et al. further discloses cell is formed directly on a growth enhancing sublayer (col.4, lines 10-43, and col.20-col.21 example 3A).

Allowable Subject Matter

5. Claims 15 & 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 21-36 allowed.

Claim 21 is allowable over Prior Art of Record since the cited references taken alone or in combination do not teach or suggest a patterned recording medium comprising (b) a magnetic moment substantially decoupled from the magnetic moments of neighboring cells in its island, and (c) a magnetic coercivity different from the coercivities of neighboring cells in its island.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Yamane et al. (US, 5,844,755) discloses a giant magnetoresistive information recording medium, and associated recording and reproducing method and apparatus.
- Marinero et al. (US 6,773,764 B2) discloses a method of forming a patterned magnetic recording medium.
- Fullerton et al. (US 6,391,430 B1) discloses a patterned magnetic recording media with discrete magnetic regions separated by regions of antiferromagnetically coupled films.
- Hintz et al. (US 2004/0265639 A1) discloses a NICR and NIFECR seed layers for perpendicular magnetic recording media.
- Sato et al. (US 5,458,987) discloses a multilayered magnetooptical recording medium.
- Mukai et al. (US 6,171,676 B1) discloses a magnetic recording medium containing fine magnetic crystal grains and its manufacture.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E Mercedes whose telephone number is 703-306-4082. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dismery E Mercedes
Examiner
Art Unit 2651

DM 2/18/2005

DAVID HUDSPETH
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